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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

VU, QUYNH NHU H

ART UNIT	PAPER NUMBER
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2827

DATE MAILED: 01/16/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/852,998

Applicant(s)

CHAMBERLIN ET AL.

Examiner

Quynh-Nhu H. Vu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) 1-9 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 10-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

**DETAILED ACTION**

***Election/Restrictions***

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
  - I. Claims 1-9, drawn to a method to repair or modify a land grid array, classified in class 29, subclass 825.
  - II. Claims 10-19, drawn to a printed circuit board, classified in class 174, subclass 255.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions I and II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case, a hole can be formed with etching method instead of using drilling method.

3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

4. During a telephone conversation with Frederick E. Cooperrider on 12/20/01 a provisional election was made with traverse to prosecute the invention of Group II, claims 10-19.

Affirmation of this election must be made by applicant in replying to this Office action. Claims 1-9 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the

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currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a petition under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

### ***Specification***

6. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: the specification does not disclose the feature: "a diameter sufficient to electrically isolate a corresponding one of the contact pads from said connected electronic component or structure", as recited in claim 19.

### ***Claim Rejections - 35 USC § 112***

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 10-19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 10 is confusing. According to the claim 10, applicant claims only pad and trace but applicant does not claim printed circuit board and plurality of contact pad. However, because of the statement of first contact pad portion to serve as a replacement contact pad is appear. Does applicant mean a contact pad portion connected to a second trace on printed circuit board?

***Claim Rejections - 35 USC § 102***

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

10. Claims 10 and 16-18 are rejected under 35 U.S.C. 102(e) as being anticipated by Fillion et al. [US 6,239,482].

Fillion et al. disclose in Figs. 2-4 a replacement pad/trace structure comprising: a first contact pad (224) having shape and dimension to serve as a replacement contact pad; a second trace portion (324) comprising a conductive material electrically connected to said first portion.

As to claim 16, an outer insulating layer (216) on a portion of the second trace portion.

As to claim 17, a conductive layer (32) on the outer surface of the insulating layer.

As to claim 18, an outer insulating layer (16) on the outer of surface of said conductive layer.

11. Claim 10 is rejected under 35 U.S.C. 102(e) as being anticipated by Arndt et al. [US 6,232,564].

Arndt et al. disclose in Fig. 3 a replacement pad/trace structure comprising a first contact pad portion (25-28) having shape and dimensions to serve as replacement contact pad; a second trace portion (44, 46) comprising a conductive material electrically connected to the first portion.

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***Claim Rejections - 35 USC § 103***

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fillion et al. or Arndt et al.

Fillion et al. or Arndt et al. disclose all claimed subject matter except for the first contact pad and the second trace portion comprised of copper foil. However, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to employ the contact pad and the trace comprised of copper foil, since copper is very good electrical conductivity. Furthermore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to employ the pad and the trace comprised of copper, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416.

14. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fillion et al./ Arndt et al. in view of Takeda [US 6,014,318].

Fillion et al. or Arndt et al. disclose all claimed subject matter except for a bottom surface of first contact pad and the second trace portion coated with a heat activated adhesive.

Takeda discloses in Fig. 5 a bottom surface of a first contact pad (125) and a second trace portion (106) coated with an adhesive (103).

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It would have been obvious to one of ordinary skill in the art at the time of the invention was made to employ the adhesive coated on the bottom surface of the pad and trace in order to protect and able to connect with other layers.

15. Claims 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fillion et al. / Arndt et al in view of Hashimoto et al. [US 6,225,569].

Fillion et al./ Arndt et al. do not disclose a portion the first contact pad and second trace portion plated with gold and nickel.

Hashimoto et al. disclose the reason why a contact pad (11) need to plated with gold and nickel (col. 3, lines 31-39).

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to employ the contact pad or trace plated with gold and nickel, since nickel plating layer improves and stabilizes soldering wettability and gold plating layer prevents oxidization.

16. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fasano et al. [US 5,940,966].

Fasano et al. disclose in Figs. 1-3 a printed circuit board comprising: one or more layers; and at least one land grid array (BGA) interface mounted thereon, said land grid array interface comprising a plurality of contact pads (20c, b) on a first surface of the printed circuit board, wherein at least the contact pads connected by a conductor to at least one electronic component on the layers by a plated through hole (see Figs. 3b, c-d), and wherein at least one of the plated through holes having diameter sufficient to electrically isolate one of the contact pads (i.e., 28b' and 28b'' of Fig. 3b-c; or 20b and 20c of Fig. 3d).

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The product-by-process limitation "has been modified by drilling a hole" has not been give weight in determining the patentability of the device claim. See MPEP §2113.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quynh-Nhu H. Vu whose telephone number is 703-305-0850. The examiner can normally be reached on 7:30-5:00 (M-F).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeffrey Gaffin can be reached on 703-308-3301. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7724 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

QNV  
January 4, 2002

  
K. Vu  
Primary Examiner